UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,276	04/01/2004	Paul Michael McAllister	TH-2306 02 (US) HS:KNL	8372

23632 7590 08/09/2007

SHELL OIL COMPANY
P O BOX 2463
HOUSTON, TX 772522463

EXAMINER	
BOYER, RANDY	
ART UNIT	**PAPER NUMBER**
1764	
MAIL DATE	**DELIVERY MODE**
08/09/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/815,276	MCALLISTER ET AL.	
	Examiner	Art Unit	
	Randy Boyer	1764	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 July 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14 and 19-33* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14 and 19-33* is/are rejected.

7)☒ Claim(s) *10,11 and 19* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *See Continuation Sheet*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :

16 July 2004; 21 December 2004; and 16 July 2007.

DETAILED ACTION

Claim Objections

1. Claims 10 and 11 are objected to for improper use of the English language.

2. With respect to claims 10 and 11, both claims include the limitation "wherein the ratio of the tube diameter to the nominal outside diameter in the range of from about . . .". The claim language is improper in form because it is lacking a verb. Examiner suggests correction by inserting an appropriate verb, e.g. "wherein the ratio of the tube diameter to the nominal outside diameter *is* in the range of from about . . ." (emphasis added). Appropriate correction is required.

3. Claim 19 is objected to for use of repeated words.

4. With respect to claim 19, the claim reads in relevant part "the ratio of the tube diameter to the nominal outside diameter is in the range of from about about 2 to about 10 . . .". Examiner suggests correction by striking the second recitation of the word "about" from the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-11, 13, 19-30, and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4511671). Alternatively, claims 1-11, 13, 14, 19-30, 32,

and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4511671) as evidenced by Murphy (US 4358623).

9. With respect to claim 1, Saito discloses a reactor system comprising: an elongated tube (see Saito, column 4, lines 20-22) having a reaction zone defined by a tube length and a tube diameter, the tube diameter being at least 25.4 mm (see Saito, column 4, lines 20-22); wherein contained within the reaction zone is a packed bed of shaped support material (see Saito, drawing; and column 4, lines 10-15); and wherein the shaped support material has a hollow cylinder geometric configuration defined by a nominal length, a nominal outside diameter and a nominal inside diameter such that the ratio of the nominal length to the nominal outside diameter is in the range of from about 0.5 to about 2 (see Saito, column 4, lines 10-15), and further such that the ratio of the nominal outside diameter to the nominal inside diameter exceeds about 2.7 (see Saito, column 4, lines 10-15), and the ratio of the tube diameter to the outside diameter is in the range of from about 2 to about 10 (see Saito, column 4, lines 10-22).

Saito does not disclose wherein the tube diameter is at least 28 mm.

However, Saito discloses wherein the tube diameter is at least 25.4 mm (see Saito, column 4, lines 20-22). Examiner notes that Saito's tube diameter differs from that of Applicant's claim 1 by only 2.6 mm (about a 10% difference in size). Furthermore, while Saito discloses the use of a 25.4 mm diameter tube in his Examples, these are merely test (or pilot) runs provided to demonstrate the advantages of his invention. In fact, Saito contemplates the use of his system for industrial production which implies a scale-up of the system to a larger size (see Saito, column 2, lines 34-

39). Finally, while Saito only discloses the use of a 25.4 mm diameter tube, his invention is in no way limited to the size of the tube that may be employed – i.e. a tube of *any* size may be used so long as the other parameters defining the scope of Saito's invention are satisfied.

Thus, Examiner finds Applicant's limitation wherein "the tube diameter being at least 28 mm" to be of no patentable consequence in view of the teachings of Saito. In this regard, the court has instructed that the mere scaling up of a prior art system capable of being scaled up cannot support the patentability of an old system so scaled. See MPEP § 2144.04(IV)(A) (citing *Gardner v. TEC Systems, Inc.*, 725 F.2d 1338 (Fed. Cir. 1984)).

10. With respect to claims 2 and 3, Saito discloses wherein the hollow cylinder geometric configuration may have dimensions in the range such that the ratio of the nominal outside diameter to the nominal inside diameter is: at least about 4.5, when the outside diameter is in the range of from about 10.4 mm to about 11.6 mm; or at least about 3.6, when the outside diameter is in the range of from about 9.4 mm to about 10.6 mm; or in the range of from about 2.6 to about 7.3, when the outside diameter is in the range of from about 8.4 mm to about 9.6 mm (see Saito, column 2, lines 17-20).

11. With respect to claims 4 and 8, Saito's system is not specifically limited with respect to tube diameter or tube length. Thus, a tube of *any* diameter and length may conceivably be used.

12. With respect to claims 5-7, Saito discloses wherein the inside diameter of the hollow cylinder geometric configuration is at least about 0.2 mm; and wherein the ratio

of nominal outside diameter to nominal inside diameter is in the range of from about 3.3 to about 250 (see Saito, column 4, lines 12-15).

13. With respect to claim 9, Saito discloses wherein the reaction tube is filled with catalyst having a hollow cylindrical geometric configuration (see Saito, column 4, lines 21-22).

14. With respect to claims 10 and 11, Saito discloses wherein the ratio of the tube diameter to the nominal outside diameter is in the range of from about 3 to about 7 (see Saito, column 4, lines 10-22).

15. With respect to claim 13, Saito discloses wherein the shaped support material supports a catalytic component (see Saito, column 3, lines 6-16 and 65-68; and column 4, lines 1-20).

16. With respect to claim 19, Saito discloses a reactor system comprising: an elongated tube (see Saito, column 4, lines 20-22) having a reaction zone defined by a tube length and a tube diameter, the tube diameter being at least 25.4 mm (see Saito, column 4, lines 20-22); wherein contained within the reaction zone is a packed bed of shaped support material (see Saito, drawing; and column 4, lines 10-15); and wherein the shaped support material has a hollow cylinder geometric configuration defined by a nominal length, a nominal outside diameter and a nominal inside diameter such that the ratio of the nominal length to the nominal outside diameter is in the range of from about 0.5 to about 2 (see Saito, column 4, lines 10-15), and further such that the ratio of the nominal outside diameter to the nominal inside diameter exceeds about 2.7 (see Saito,

column 4, lines 10-15), and the ratio of the tube diameter to the outside diameter is in the range of from about 2 to about 10 (see Saito, column 4, lines 10-22).

Saito does not disclose wherein the tube diameter is at least 28 mm; or wherein the ratio of the nominal outside diameter to the nominal inside diameter provides a positive test, wherein "positive test result" is defined by a decrease of the quotient of a numerical value of the pressure drop per unit length of the packed bed and a numerical value of the packing density, which numerical values are obtained by testing the packed bed in a turbulent flow of nitrogen gas at a pressure of 1.136 MPa (150 psig), relative to a comparison quotient of numerical values obtained in an identical manner, except that the hollow cylinder geometric configuration of the same support material is defined by a nominal outside diameter of 8 mm and a nominal inside diameter of 3.2 mm, and a ratio of the nominal length to the nominal outside diameter of 1.

However, Examiner finds Applicant's limitation wherein "the tube diameter being at least 28 mm" to be of no patentable consequence in view of the teachings of Saito (see discussion *supra* at paragraph 9). Moreover, it is known in the art that pressure drop across a packed bed is a function of packing density (see e.g. Murphy (US 4358623), column 3, lines 50-53). In other words, packing density is a "result-effective variable," changes in which will necessarily result in corresponding changes in pressure drop per unit length of a packed bed.

Therefore, Examiner finds Applicant's limitation "wherein the ratio of the nominal outside diameter to the nominal inside diameter provides a positive test, wherein 'positive test result' is defined by a decrease of the quotient of a numerical value of the

pressure drop per unit length of the packed bed and a numerical value of the packing density, which numerical values are obtained by testing the packed bed in a turbulent flow of nitrogen gas at a pressure of 1.136 MPa (150 psig), relative to a comparison quotient of numerical values obtained in an identical manner, except that the hollow cylinder geometric configuration of the same support material is defined by a nominal outside diameter of 8 mm and a nominal inside diameter of 3.2 mm, and a ratio of the nominal length to the nominal outside diameter of 1" to be of no patentable consequence since a person having ordinary skill in the art and having an appreciation for Saito could easily meet such limitation through mere routine experimentation. See MPEP § 2144.05(II).

17. With respect to claim 20, Saito discloses wherein the hollow cylinder geometric configuration is defined such that the ratio of the nominal outside diameter to the nominal inside diameter exceeds about 2.7 (see Saito, column 4, lines 10-15).

18. With respect to claims 21 and 22, Saito discloses wherein the hollow cylinder geometric configuration may have dimensions in the range such that the ratio of the nominal outside diameter to the nominal inside diameter is: at least about 4.5, when the outside diameter is in the range of from about 10.4 mm to about 11.6 mm; or at least about 3.6, when the outside diameter is in the range of from about 9.4 mm to about 10.6 mm; or in the range of from about 2.6 to about 7.3, when the outside diameter is in the range of from about 8.4 mm to about 9.6 mm (see Saito, column 2, lines 17-20).

19. With respect to claims 23 and 27, Saito's system is not specifically limited with respect to tube diameter or tube length. Thus, a tube of *any* diameter and length may conceivably be used.

20. With respect to claims 24-26, Saito discloses wherein the inside diameter of the hollow cylinder geometric configuration is at least about 0.2 mm; and wherein the ratio of nominal outside diameter to nominal inside diameter is in the range of from about 3.3 to about 250 (see Saito, column 4, lines 12-15).

21. With respect to claim 28, Saito discloses Saito discloses wherein the reaction tube is filled with catalyst having a hollow cylindrical geometric configuration (see Saito, column 4, lines 21-22).

22. With respect to claims 29 and 30, Saito discloses wherein the ratio of the tube diameter to the nominal outside diameter is in the range of from about 3 to about 7 (see Saito, column 4, lines 10-22).

23. With respect to claim 32, Saito discloses wherein the shaped support material supports a catalytic component (see Saito, column 3, lines 6-16 and 65-68; and column 4, lines 1-20).

24. Claims 12, 14, 31, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4511671) in view of Tamura (US 4645754). Alternatively, claims 1-11, 13, 14, 19-30, 32, and 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saito (US 4511671) in view of Tamura (US 4645754), as evidenced by Murphy (US 4358623).

25. With respect to claim 12, Saito discloses a reactor system comprising: an elongated tube (see Saito, column 4, lines 20-22) having a reaction zone defined by a tube length and a tube diameter, the tube diameter being at least 25.4 mm (see Saito, column 4, lines 20-22); wherein contained within the reaction zone is a packed bed of shaped support material (see Saito, drawing; and column 4, lines 10-15); and wherein the shaped support material has a hollow cylinder geometric configuration defined by a nominal length, a nominal outside diameter and a nominal inside diameter such that the ratio of the nominal length to the nominal outside diameter is in the range of from about 0.5 to about 2 (see Saito, column 4, lines 10-15), and further such that the ratio of the nominal outside diameter to the nominal inside diameter exceeds about 2.7 (see Saito, column 4, lines 10-15), and the ratio of the tube diameter to the outside diameter is in the range of from about 2 to about 10 (see Saito, column 4, lines 10-22).

Saito does not disclose wherein the tube diameter is at least 28 mm; or wherein the shaped support material comprises predominantly alpha-alumina, and the packed bed has a packing density greater than about 550 kg per cubic meter.

However, Examiner finds Applicant's limitation wherein "the tube diameter being at least 28 mm" to be of no patentable consequence in view of the teachings of Saito (see discussion *supra* at paragraph 9). Moreover, Tamura discloses the use of hollow cylindrical geometric configurations as catalyst carriers wherein the active catalytic components are impregnated onto a porous inorganic refractory carrier, such as α-alumina (see Tamura, column 3, lines 29-40; column 5, lines 53-56; and Example 3). Tamura explains that using such a support material as a catalyst carrier allows for high

selectivity while experiencing only a minimal pressure loss across a reactor bed making use of such catalyst supports (see Tamura, column 3, lines 29-40). On the other hand, Saito discloses wherein the catalyst structures of his invention are prepared by mixing the active catalytic components with a silica sol and thereafter heating, drying, pulverizing, and molding into the final support structure (see Saito, column 3, lines 65-68; and column 4, lines 1-15). Thus, while Saito notes that the hollow cylindrical catalyst support structures naturally result in lower pressure drops across reactor beds using such structures (i.e. lower than would be possible with support structures having other shapes) (see Saito, column 2, lines 34-39), the *porous* catalytic support structures of Tamura would be expected to result in an even lower pressure drop than achievable by using the structures of Saito.

Therefore, the person having ordinary skill in the art of reactor systems would have been motivated to modify the system of Saito so as to incorporate use of Tamura's porous catalyst support structures in order to achieve a lower pressure drop over the reactor bed of Tamura and thereby realize a cost savings in energy demand associated with blower utility requirements to supply gaseous reactants to the bed.

In addition, the person having ordinary skill in the art of reactor systems would have had a reasonable expectation of success in using Tamura's catalyst support structures in the reactor system of Saito because (1) both Saito and Tamura are concerned with vapor phase oxidation reactions carried out in packed bed tubular reactors, (2) the catalyst support structures of Tamura are entirely compatible for use within the reactor system of Saito, (3) Saito is concerned with lowering the energy

demands of a packed bed reactor by lowering the pressure drop across the bed, (4) it is known in the art that an increase in bed porosity will lead to a decrease in pressure drop, and (5) Tamura discloses the use of porous support structures as a means of lowering the pressure drop across a packed bed reactor.

Finally, Examiner notes that Saito does not disclose wherein the packed bed has a tube packing density greater than about 550 kg per cubic meter. However, it is known that tube packing density is a function (in part) of the tube dimensions. Moreover, Saito is not specifically limited with respect to tube diameter or tube length. Thus, a tube of *any* diameter and length may conceivably be used, and the person having ordinary skill in the art and with an appreciation for Saito could easily meet the limitation wherein "the tube packing density [is] greater than about 550 kg per cubic meter" by simply varying the tube dimensions accordingly. See MPEP § 2144.05(II). Thus, Examiner finds Applicant's limitation wherein "the tube packing density [is] greater than about 550 kg per cubic meter" to be of no patentable consequence.

26. With respect to claim 14, Tamura discloses wherein the catalytic component comprises silver (see Tamura, Abstract).

27. With respect to claim 31, Saito discloses a reactor system comprising: an elongated tube (see Saito, column 4, lines 20-22) having a reaction zone defined by a tube length and a tube diameter, the tube diameter being at least 25.4 mm (see Saito, column 4, lines 20-22); wherein contained within the reaction zone is a packed bed of shaped support material (see Saito, drawing; and column 4, lines 10-15); and wherein the shaped support material has a hollow cylinder geometric configuration defined by a

nominal length, a nominal outside diameter and a nominal inside diameter such that the ratio of the nominal length to the nominal outside diameter is in the range of from about 0.5 to about 2 (see Saito, column 4, lines 10-15), and further such that the ratio of the nominal outside diameter to the nominal inside diameter exceeds about 2.7 (see Saito, column 4, lines 10-15), and the ratio of the tube diameter to the outside diameter is in the range of from about 2 to about 10 (see Saito, column 4, lines 10-22).

Saito does not disclose wherein the tube diameter is at least 28 mm; wherein the ratio of the nominal outside diameter to the nominal inside diameter provides a positive test, wherein "positive test result" is defined by a decrease of the quotient of a numerical value of the pressure drop per unit length of the packed bed and a numerical value of the packing density, which numerical values are obtained by testing the packed bed in a turbulent flow of nitrogen gas at a pressure of 1.136 MPa (150 psig), relative to a comparison quotient of numerical values obtained in an identical manner, except that the hollow cylinder geometric configuration of the same support material is defined by a nominal outside diameter of 8 mm and a nominal inside diameter of 3.2 mm, and a ratio of the nominal length to the nominal outside diameter of 1; or wherein the shaped support material comprises predominantly alpha-alumina, and the packed bed has a packing density greater than about 550 kg per cubic meter.

However, Examiner finds Applicant's limitations "the tube being at least 28 mm" and "the ratio of the nominal outside diameter to the nominal inside diameter provides a positive test, wherein 'positive test result' is defined by a decrease of the quotient of a numerical value of the pressure drop per unit length of the packed bed and a numerical

value of the packing density, which numerical values are obtained by testing the packed bed in a turbulent flow of nitrogen gas at a pressure of 1.136 MPa (150 psig), relative to a comparison quotient of numerical values obtained in an identical manner, except that the hollow cylinder geometric configuration of the same support material is defined by a nominal outside diameter of 8 mm and a nominal inside diameter of 3.2 mm, and a ratio of the nominal length to the nominal outside diameter of 1" to be of no patentable consequence (see discussion *supra* at paragraphs 9 and 16). Moreover, Tamura discloses the use of hollow cylindrical geometric configurations as catalyst carriers wherein the active catalytic components are impregnated onto a porous inorganic refractory carrier, such as α-alumina (see Tamura, column 3, lines 29-40; column 5, lines 53-56; and Example 3). Tamura explains that using such a support material as a catalyst carrier allows for high selectivity while experiencing only a minimal pressure loss across a reactor bed making use of such catalyst supports (see Tamura, column 3, lines 29-40). On the other hand, Saito discloses wherein the catalyst structures of his invention are prepared by mixing the active catalytic components with a silica sol and thereafter heating, drying, pulverizing, and molding into the final support structure (see Saito, column 3, lines 65-68; and column 4, lines 1-15). Thus, while Saito notes that the hollow cylindrical catalyst support structures naturally result in lower pressure drops across reactor beds using such structures (i.e. lower than would be possible with support structures having other shapes) (see Saito, column 2, lines 34-39), the *porous* catalytic support structures of Tamura would be expected to result in an even lower pressure drop than achievable by using the structures of Saito.

Therefore, the person having ordinary skill in the art of reactor systems would have been motivated to modify the system of Saito so as to incorporate use of Tamura's porous catalyst support structures in order to achieve a lower pressure drop over the reactor bed of Tamura and thereby realize a cost savings in energy demand associated with blower utility requirements to supply gaseous reactants to the bed.

In addition, the person having ordinary skill in the art of reactor systems would have had a reasonable expectation of success in using Tamura's catalyst support structures in the reactor system of Saito because (1) both Saito and Tamura are concerned with vapor phase oxidation reactions carried out in packed bed tubular reactors, (2) the catalyst support structures of Tamura are entirely compatible for use within the reactor system of Saito, (3) Saito is concerned with lowering the energy demands of a packed bed reactor by lowering the pressure drop across the bed, (4) it is known in the art that an increase in bed porosity will lead to a decrease in pressure drop, and (5) Tamura discloses the use of porous support structures as a means of lowering the pressure drop across a packed bed reactor.

Finally, Examiner notes that Saito does not disclose wherein the packed bed has a tube packing density greater than about 550 kg per cubic meter. However, it is known that tube packing density is a function (in part) of the tube dimensions. Moreover, Saito is not specifically limited with respect to tube diameter or tube length. Thus, a tube of *any* diameter and length may conceivably be used, and the person having ordinary skill in the art and with an appreciation for Saito could easily meet the limitation wherein "the tube packing density [is] greater than about 550 kg per cubic meter" by simply varying

the tube dimensions accordingly. See MPEP § 2144.05(II). Thus, Examiner finds Applicant's limitation wherein "the tube packing density [is] greater than about 550 kg per cubic meter" to be of no patentable consequence.

28. With respect to claim 33, Tamura discloses wherein the catalytic component comprises silver (see Tamura, Abstract).

Conclusion

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure: Burlingame (EP 1277698 A2), and J.W. Fulton, *Selecting the Catalyst Configuration*, CHEMICAL ENGINEERING, May 12, 1986, pps. 97-101.

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Randy Boyer whose telephone number is (571) 272-7113. The examiner can normally be reached Monday through Friday from 8:00 A.M. to 5:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn A. Caldarola, can be reached at (571) 272-1444. The fax number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

RPB

Glenn Caldarola
Supervisory Patent Examiner
Technology Center 1700